

PVC GRAVITY PIPE SEWER

ITEM 1400

PART 1 - GENERAL

WORK INCLUDED: (Sec. 01) Furnish and install PVC gravity pipe sewer and fittings as indicated on the Drawings and specified.

RELATED WORK: (Sec. 02) Furnished/paid for in this Item: (as applicable)

- Granular Backfill
- Earth Excavation/Backfill
- Sheeting and Timbering
- Testing of Pipe Lines and Sewers

Furnished/paid for in respective Item: (as applicable)

- Rock Excavation and Backfill
- Topsoil
- Seeding
- Bulk Concrete (as specified)

DESCRIPTION: (Sec. 03) Work in this Item consists generally of excavating for, and the proper installation of, PVC gravity sewer pipe, fittings, testing the installation and associated work.

QUALITY ASSURANCE: (Sec. 04) Materials shall be new and of their best quality.

Materials shall be subject to inspection and approval upon delivery to job site.

REFERENCES: (Sec. 05)

- ASTM - American Society for Testing and Materials
- ODOT - Ohio Department of Transportation

SUBMITTALS: (Sec. 06) Shop Drawings - See General Conditions. Provide four sets for record purposes only. Include pipe material, dimensions, joint/gasket details and certification that materials conform to current, applicable standards.

DELIVERY, STORAGE, HANDLING: (Sec. 07) Methods of handling, unloading and storage of pipe and fittings shall be in accordance with manufacturer's recommendations.

ALTERNATES/ALTERNATIVES: (Sec. 08) Alternate pipe/fittings are specified in this Item. See General notes on Drawings for specific type(s) to be installed.

MEASUREMENT: (Sec. 09) The number of Y branches for standard service sewers of reconnection of existing service sewers, shall be the number actually installed in the completed work.

The number of service stacks including WYE branches and inserta tees for standard service sewers, or reconnection of existing service sewer, shall be the number actually installed in the completed work.

The number of reconnections of existing service sewers shall be the number actually installed.

The length of standard service sewer shall be the total number of lineal feet actually installed in the completed work as measured along the centerline of the standard service sewer from the connection point of the truck or street sewer and the service sewer, to the end of each standard service sewer as installed, or to the point of reconnection to an existing service sewer, as described in Item 1400-A.

The length of PVC sewer pipe shall be the total number of lineal feet of each size actually furnished and placed, measured along the axis of the pipe after the pipe has been connected in place. The inside diameter of manholes and the length of special structures shall be deducted. No deductions shall be made for the length of fittings or specials in the sewer line.

WARRANTY: (Sec. 10)

See General Conditions.

PART 2 - PRODUCTS

MATERIALS: (Sec. 11 Pipe and fittings 4 inches through 15 inches diameter shall be solid wall ASTM Specification D-3034 SDR-35, ASTM F-789, or smooth interior/corrugated exterior, ASTM Specification F-949, or ASTM Specification F-794 as indicated on the Drawings.

Pipe and fittings 18 inches and larger shall conform to ASTM Specification F-679, wall thickness T-1, or ASTM F-794.

Pipe shall be furnished in standard manufactured lengths. Each length of pipe shall be marked with manufacturer's name, nominal diameter, and "home" mark on the spigot end to indicate when the pipe is inserted to the "home" position.

Joints shall be push-on type, with an elastomeric ring gasket compressed in an annular space between a bell end and spigot end of pipe, conforming to ASTM D-3212.

Elastomeric ring gaskets shall conform to ASTM F-477 for low head application.

Bedding material shall be Class 1-A material as per ASTM D-2321

PART 3 - EXECUTION

INSPECTION: (Sec. 12) Inspect site and determine conditions that may effect the proper execution of the work.

Pipe, fittings and specials shall be carefully examined by the Contractor and Resident Representative for effects just before laying. No pipe or fitting shall be used which is known to be

defective. Pipe and fittings shall be thoroughly cleaned before being laid.

PREPARATION: (Sec. 13) Soil Erosion/Sedimentation control measures shall be implemented as required to prevent permanent damage to the construction site.

INSTALLATION: (Sec. 14) Pipe and fittings shall be installed per ASTM D-2321 "Underground Installation of Flexible Thermoplastic Sewer Pipe".

Use laser beam for establishing line and grade. The method used shall be as recommended by the manufacturer of the laser equipment and must be satisfactory to the Resident Representative. The laser beam shall not be of greater power than 2.5 milliwatts (0.0025). A continual visual check shall be provided by the laser equipment.

The contractor shall not deviate from the required line of grade without the written consent of the Consulting Engineer.

No pipe shall be laid until a sufficient length of trench has been properly prepared to permit laying at least one standard length of pipe at one time.

Excavate and backfill as specified in the applicable Item for excavation and backfill, within the measurement limits indicated on the Drawings, except as modified by the section covering "Additional Authorized Excavation" in the Item for Earth Excavation/Backfill. Install pipe in well compacted bedding material, placed on undisturbed earth or well compacted foundation material. Uniformly support pipe throughout its length except for the bell holes required for the proper installation of the joints. The ends or shoulder of each pipe shall abut against the adjacent pipe in such manner that there will be not unevenness along the inverts.

Pipe shall not be laid in water or on frozen trench bottom or, when in the opinion of the Resident Representative, trench conditions or weather are unsuitable for such work.

Pipe delivered for installation shall be strung so as to minimize the entrance of foreign material. At the end of the day, and at such other times that work is not in progress, all openings in the pipe line shall be plugged. Joints of all pipe in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dewatered.

Concrete Cradle, Arch or Encasement: Concrete used to encase or support the pipe shall be paid for in its respective Item. Concrete used for the encasement of vertical drop pipes, tees and ells associated with drop manholes, and for encasement of service stacks, shall be included with the respective Item.

Wherever Type A (Concrete) bedding or arch is used instead of granular material due to exceeding the measurement limits of the trench, no additional payment will be made for the concrete used. Concrete shall be as specified in the Item for Bulk Concrete. Care shall be taken to prevent flotation of the pipe. All type A bedding shall be placed on undisturbed earth or well compacted backfill.

Wyes, Stacks, Service Sewer, and Reconnections: Y branches, service stacks and house service sewers shall be 6 inches in diameter unless specifically shown or called for as a different size.

Each Y branch shall consist of furnishing and placing a Y branch in the main sewer, straight pipe

riser, elbow at the top of the stack, stoppers, if required, concrete encasement, additional excavation, and location marker. A stack shall be used only when the centerline of the trunk or street sewer is more than four (4) feet below the expected elevation of the house service at the street sewer unless otherwise shown on the Drawings.

Each standard service sewer shall consist of all earth excavation and backfill, granular bedding material, furnishing and installing all straight and curved pipe at the grade determined by the Resident Representative, (0.62% min.) from the Y branch or service stack to the property line, unless otherwise indicated on the Drawings, or to the point of reconnection to an existing service sewer. Included shall be all joint materials, adapters, stoppers, location markers, testing and clean-up.

Reconnection of existing service sewers shall consist of locating the existing service sewer, maintaining flow as required, all required earth excavation and backfill, bedding, disconnecting the existing service sewer from the existing trunk or street sewer, removal of existing service sewer when required, securely plugging the discontinued service sewer when required, providing and installing adapters if connecting different type of pipe, and making a proper connection to the new service sewer.

Y branches, service stacks and service sewer required for the proper completion of a reconnection shall be furnished and installed under this Item, unless specified under Item 1400-A.

The location of Y branches and service stacks and the ends of service sewers shall be marked with a 3/4 inch diameter steel pin, 30 inches long. Ends of service sewers shall be marked by a 4" x 4" wye post.

Where curbs are available, the location of each service sewer shall be marked by a two inch cross cut into the top of the curb on the side of the street to be served by the service sewer.

In all cases the open ends of Y branches, service stacks and pipes shall be securely closed with carefully fitted stoppers which will not move during field testing, and sealed to prevent the entrance of water, earth or other substance into the sewer. Approved plastic stoppers may be used if they fit properly into the bell.

Abandoning Existing Sewers: Where existing sewer lines are encountered during construction and are indicated on the Drawings or determined by the Resident Representative to be abandoned, all broken pipe within the excavation limits of the new construction shall be removed to permit proper placement of bedding and new pipe. At locations where the sewer to be abandoned falls outside of the excavation limits, broken and cracked pipe shall be removed back to a sound joint where a masonry plug shall be constructed of brick and mortar to completely seal the abandoned sewer from the infiltration of soil and water. The cost of abandoning existing sewers, including removal of broken and cracked pipe and installing plugs, shall be included in the price bid for installing new pipe.

FIELD QUALITY CONTROL: (Sec. 15)

Field Testing: Upon completion of two manhole spans (approximately 800 feet - 1000 feet) the Contractor may begin testing the first manhole span (approximately 400 - 500 feet). Thereafter, testing shall be performed within 1000 feet of the pipe laying.

Test shall be infiltration, exfiltration or low pressure air test in accordance with the Item for Testing of Pipe Lines and Sewers, Item 1600.

In addition to the leakage test, after 30 days the contractor shall furnish all labor, Materials and equipment and perform a deflection test using a mandrel whose diameter is equal to 95% of the inside diameter of the pipe, manually pulled through the sewer line.

The mandrel shall have a minimum of eight legs, and shall test for inside diameter dimensions 95% of those stated in ASTM D-3034.

Deflection tests shall be made on all sections of sewer.

Deflection of the pipe shall not exceed 5%.

Any section of pipe not meeting the deflection test shall be uncovered and "re-rounded" by re-compacting the bedding Material, or by other means as required, or as directed by the Resident Representative, and the pipe retested until it meets requirements.

CLEAN-UP: (Sec. 16)

Clean-up of Site: Remove all surplus excavation, pipe, broken concrete, stones, and miscellaneous debris and dispose of off the site. Grading providing drainage shall be included.

The clean-up and disposal of the cleared materials shall be done as soon as practical after laying of the sewer pipe and as the Resident Representative may direct. However, clean-up work shall not fall behind the pipe laying more than 800 feet. Should the Contractor not keep his clean-up work within the aforementioned distance the Contractor shall be required to cease further pipe laying until such clean-up is accomplished.

Cleaning of Pipe: After completion of the pipe installation, and prior to acceptance by the Owner, the Contractor shall, with the Owner and Resident representative, inspect the interior of the pipe. All foreign materials such as silt, gravel, debris, etc. shall be removed and disposed of off the site.